

REMARKS/ARGUMENTS

This is a Response to the Office Action mailed October 21, 2003, in which a three (3) month Shortened Statutory Period for Response has been set, due to expire January 21, 2004. Enclosed is our check to cover the fee for a two-month extension of time, to March 21, 2004. Sixty-three (63) claims, including thirteen (13) independent claims, were paid for in the application. Claims 1, 8-13, 16-18, 21, 25, 28, 33, 35-36, 38-40, 46, 50, 53 and 57 have been amended. The amendments do not introduce any new matter and are supported by the present specification. (See, *e.g.*, page 9, line 22 – page 10, line 2, regarding “substantially constant voltage” operation; and page 9, line 26 – page 10, line 10; page 12, lines 14-19; and claim 7 as originally filed, regarding “at least one of a fuel and an oxidant flow.”) No fee for additional claims is due by way of this Amendment. The Commissioner is authorized to charge any additional fees due by way of this Amendment, or credit any overpayment, to our Deposit Account No. 19-1090. Claims 1-63 are pending.

Objections

The drawings were objected to because the lead line for reference number 24 in Figure 8 appears to be incorrect. Figure 8 has been amended to reflect the correct placement of the lead line for reference number 24.

The drawings were also objected to because the invention of claims 58-63 must be shown. Contrary to the Examiner’s contention, the drawings show the invention of claims 58 – 63. Specifically, Figure 11 is illustrate the subject matter of claims 58 –63, as clearly set out in the supporting text, starting at page 14, line 9, of the present specification.

The specification was objected to because it contains references to applications identified only by the attorney’s docket number. Applicants have amended the specification above to include serial numbers as appropriate, and to remove the attorney’s docket numbers.

The specification was also objected to as failing to provide proper antecedent basis for the claimed subject matter because it does not appear to clearly recite: holding a pressure of the at least one reactant flow approximately constant while adjusting the partial

pressure of the at least one reactant flow (claims 8, 12 and 18), the mathematically defined relation between the determined deviation and the partial pressure of the reactant flow is an inversely proportional relationship (claim 16), the control circuit comprising an alternator controller (claim 25), the fuel cell system of claims 58-63.

Antecedent basis for the subject matter of claims 8, 12 and 18 is provided by the clarifying amendments made to said claims, and by the Declaration of Martin T. Pearson Pursuant to 37 CFR 1.132.

Antecedent basis for the subject matter of claim 16 is provided by the clarifying amendment made thereto.

Contrary to the Examiner's assertion, a control circuit comprising an alternator controller is fully supported by the specification (see Figure 6, and supporting text, page 12, lines 4 – 10).

The fuel cell system of claims 58 – 63 is also fully supported by the specification (see Figure 11, and supporting text, page 14, line 9 – page 15, line 14). Applicants request that the Examiner withdraw the objections to the specification on these grounds.

Claim 57 was objected to because of informalities which are corrected by the amendments above.

Rejections Under 35 U.S.C. § 112, Second Paragraph

In paragraphs 8-8e of the current Office Action, claims 8, 12, 18, 28, 43, 44 and 57 were rejected under 35 U.S.C. § 112, second paragraph, as being indefinite for failing to point out and distinctly claim the subject matter which applicant regards as his invention.

Paragraph 8a. The ground of rejection is addressed in the Declaration of Martin T. Pearson Pursuant to 37 CFR 1.132, establishing that one of skill in the art at the time of the invention would have readily understood the difference between pressure and partial pressure, and would have also appreciated the number of different methods of maintaining the pressure of a reactant flow while adjusting partial pressure of the constitutes of the reactant flow. The subject matter of the rejected claims is thus believed to be clear to those of skill in the art.

Paragraph 8b. The ground of rejection is rendered moot by the amendment to claim 16.

Paragraph 8c. The ground of rejection is rendered moot by the amendment to claim 28, and claim 21 from which it depends.

Paragraph 8d. The applicant is allowed to be their own lexicographer. It is permissible to define groups of cells to include single cells. Further, it is mathematically known or recognized to have groups or sets that include single members, or even no members (*i.e.*, null set). Thus, Applicant's use of the term is consistent with known uses of the term.

Paragraph 8e. Contrary to the Examiner's assertion, claim 41 does recite "groups of the fuel cells" and provides sufficient antecedent basis for the limitation in claim 44.

35 U.S.C. §102(b) Rejections

Claim 37 was rejected under 35 U.S.C. §102(b) as being anticipated by Werth (U.S. Patent No. 4,931,947).

The Examiner correctly characterizes Figure 1 of Werth. However, Werth does *not* disclose electrically coupling portions of a battery having a plurality of battery cells in parallel with *portions of a fuel cell stack* having a plurality of fuel cells (emphasis added). Accordingly, Werth does not anticipate the subject matter of claim 37.

Claims 1-2, 5-7, 9-11, 13, 15, 17, 21-23, 26-33, 35-36, 50-53 and 55-57 were rejected under 35 U.S.C. §102(b) as being anticipated by Yamamoto (U.S. Patent No. 4,883,723).

Yamamoto does not disclose a method of operating a fuel cell system including adjusting a partial pressure of at least one of a fuel and an oxidant flow based on the determined amount of deviation of the determined operational condition of the battery from a desired operational condition of the battery, and maintaining the current from the fuel cell stack at a substantially constant voltage. Neither does Yamamoto disclose a fuel cell system comprising a control circuit coupled to receive signals corresponding to an operating condition of the battery and configured to determine a deviation of the operating condition of the battery from a desired

operational condition of the battery based on the received signals, the control circuit further coupled to control a partial pressure in a flow of a reactant to at least some of the fuel cells based on the determined deviation and to maintain an output of the fuel cell stack at a substantially constant voltage.

Thus, Yamamoto does not teach each and every element of amended method claims 1, 9, 13 or 17, or claims depending therefrom, nor or amended apparatus claims 21, 33, 35, 50 or 53, or claims depending therefrom.

Further, Yamamoto does not describe a fuel cell system comprising a fuel cell stack having a number of fuel cells; and a battery having a number of battery cells, portions of the battery *electrically couplable in parallel across respective portions of the fuel cell stack* (emphasis added). Therefore, Yamamoto does not teach each and every element of claim 29, or claims depending therefrom.

Accordingly, the rejected claims are not anticipated by Yamamoto, and reconsideration of the Examiner's rejection of claims on this ground is respectfully requested.

Rejections Under 35 U.S.C. § 103

Claims 3-4, 14-15, 24-25, 34 and 54 were rejected under 35 U.S.C. § 103(a) as being unpatentable over Yamamoto (U.S. Patent No. 4,883,723) in view of Macharg (U.S. Patent No. 3,800,208).

The deficiencies in the teaching of Yamamoto are set out above. Further, Yamamoto teaches that "the DC-DC converter 4 is controlled through the controller 16 with the result of comparison as the control signal and the output current thereof is varied so as to vary the output current of the fuel cell to the side of load 5..." (col. 4, lines 59-63). Yamamoto teaches only controlling the output current of a fuel cell and does not suggest controlling a fuel cell system to maintain an output of the fuel cell stack at a substantially constant voltage.

The deficiencies in the teaching of Yamamoto are not corrected by the disclosure of Macharg. Therefore, the subject matter of the rejected independent claims, and claims depending therefrom, is not rendered obvious by Yamamoto, alone or in view of Macharg.

Claim 20 was rejected under 35 U.S.C. § 103(a) as being unpatentable over Yamamoto (U.S. Patent No. 4,883,723) in view of Werth (U.S. Patent No. 4,931,947).

The deficiencies in the teaching of Yamamoto are set out above. The deficiencies in the teaching of Yamamoto are not corrected by the disclosure of Werth. Therefore, the subject matter of the rejected claim 20 is not rendered obvious by Yamamoto, alone or in view of Werth.

Claim 19 was rejected under 35 U.S.C. § 103(a) as being unpatentable over Yamamoto (U.S. Patent No. 4,883,723) in view of Werth (U.S. Patent No. 4,931,947) and further in view of Yamada (U.S. Patent No. 5,482,790).

None of the secondary references correct the deficiencies in the teaching of Yamamoto. Thus, for the same reasons, the rejected claims are not obvious in view of the various combinations of references.

Claim 25 was rejected under 35 U.S.C. § 103(a) as being unpatentable over Yamamoto (U.S. Patent No. 4,883,723) in view of Brokaw (U.S. Patent No. 5,339,018).

None of the secondary references correct the deficiencies in the teaching of Yamamoto. Thus, for the same reasons, the rejected claims are not obvious in view of the various combinations of references.

Claim 26 was rejected under 35 U.S.C. § 103(a) as being unpatentable over Yamamoto (U.S. Patent No. 4,883,723) in view of Takabayashi (U.S. Patent No. 4,839,574).

While Takabayashi teaches the general use of a microprocessor in a fuel cell system, Takabayashi does not correct the deficiencies noted above in the teaching of Yamamoto. Thus, for the same reasons, the rejected claims are not obvious in view of the various combinations of references.

Claims 37-43 and 47-49 were rejected under 35 U.S.C. § 103(a) as being unpatentable over Yamamoto (U.S. Patent No. 4,883,723) in view of Werth (U.S. Patent No. 4,931,947).

Yamamoto does not describe a fuel cell system comprising a fuel cell stack having a number of fuel cells; and a battery having a number of battery cells, portions of the battery *electrically couplable in parallel across respective portions of the fuel cell stack* (emphasis added). Neither does Werth. Even assuming, *arguendo*, that the references are properly combinable, they do not teach each and every element of claims 37 or 41, or claims depending therefrom. Accordingly, claims 37-43 and 47-49 are not rendered obvious by Yamamoto in view of Werth.

Claim 45 was rejected under 35 U.S.C. § 103(a) as being unpatentable over Yamamoto (U.S. Patent No. 4,883,723) in view of Werth (U.S. Patent No. 4,931,947) and further in view of Kujas (U.S. Patent No. 4,721,660).

The teachings of Kujas do not remedy the deficiencies of Yamamoto and Werth. Kujas does not teach or suggest the subject matter of claim 41. Again, even if the references were combined as suggested by the Examiner, they do not teach each and every element of claim 41, or claim 45 depending therefrom. Accordingly, claim 45 is not rendered obvious by Yamamoto and Werth in further view of Kujas.

Claim 46 was rejected under 35 U.S.C. § 103(a) as being unpatentable over Yamamoto (U.S. Patent No. 4,883,723) in view of Werth (U.S. Patent No. 4,931,947) and further in view of Alderman (U.S. Patent No. 6,100,665) and Bates (U.S. Patent No. 5,318,142).

None of the secondary references correct the deficiencies in the teaching of Yamamoto noted above. Thus, for the same reasons, the rejected claims are not obvious in view of the various combinations of references.

Claims 1-7, 9-11, 13-15, 17, 21-24, 26-28, 30-35, 50-53 and 58-63 were rejected under the judicially created doctrine of obviousness-type double patenting as being unpatentable over claims 1, 5, 7, 9, 14, 25, 32, 34, 43, 44, 51-53 and 55-56 of U.S. Patent No. 6,573,682. Applicant submits herewith an appropriate terminal disclaimer.

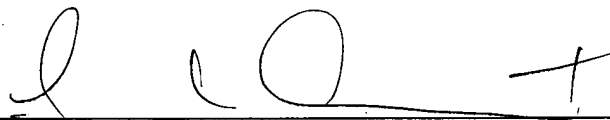
Conclusion

Overall, the cited references do not singly, or in any motivated combination, teach or suggest the claimed features of the embodiments recited in independent claims 1, 9, 13, 17, 21, 29, 33, 35, 37, 41, 50, 53 and 58, and thus such claims are allowable. Because the remaining claims depend from allowable independent claims 1, 9, 13, 17, 21, 29, 33, 35, 37, 41, 50, 53 and 58, and also because they include additional limitations, such claims are likewise allowable. If the undersigned attorney has overlooked a relevant teaching in any of the references, the Examiner is requested to point out specifically where such teaching may be found.

In light of the above amendments and remarks, Applicants respectfully submit that all pending claims are allowable. Applicants, therefore, respectfully request that the Examiner reconsider this application and timely allow all pending claims. Examiner Cantelmo is encouraged to contact Mr. Abramonte by telephone to discuss the above and any other distinctions between the claims and the applied references, if desired. If the Examiner notes any informalities in the claims, he is encouraged to contact Mr. Abramonte by telephone to expediently correct such informalities.

Respectfully submitted,

Seed Intellectual Property Law Group PLLC



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FA:lrj

Enclosure:

Postcard

One Replacement Sheet of Formal Drawings (Figure 8)

1 Annotated Sheet of Drawings

Declaration of Martin T. Pearson Pursuant to 37 CFR 1.132

Terminal Disclaimer

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